

Serial No. 09/639,678

- 4 -

Art Unit: 2815

## CLAIMS

1. (Currently amended) A method for modulating the output of an optically pumped, tunable VCSEL, wherein said method comprises optically pumped, tunable VCSEL having a top face in communication with an active region of the VCSEL and a bottom face, wherein said method comprises the steps of:

(1) optically pumping the VCSEL with by directing an output from a pump laser on the bottom face of the VCSEL so as to cause the VCSEL to generate a first output having an output power greater than zero; and

(2) modulating the output light power of the pump laser so as to modulate the carrier population in the VCSEL's active region, ~~whereby and thereby to~~ modulate the output of the VCSEL to a second output having an output power greater than zero.

2. (Currently amended) A method for modulating the output of an optically pumped, tunable VCSEL having a top face in communication with an active region of the VCSEL and a bottom face, wherein said method comprises the steps of:

(1) optically pumping the VCSEL by directing an output from with a pump laser at the bottom face of the VCSEL so as to cause the VCSEL to generate an output; and

(2) applying a voltage across the VCSEL's active region so as to alter the optical power circulating in the VCSEL's cavity, ~~whereby to increase or decrease~~ control the output power of the VCSEL.

3. (New) A tunable vertical cavity surface emitting laser (VCSEL) comprising:

a VCSEL comprising:

a substrate;

a bottom mirror mounted on top of the substrate;

an active region mounted on top of the bottom mirror;

a support disposed on the active region, the support including a top mirror,

wherein an air cavity is formed between the bottom mirror and the top mirror; and

Serial No. 09/639,678

- 5 -

Art Unit: 2815

a pump laser, directed at a bottom face of the substrate, the pump laser for providing light power at the bottom face of the substrate to cause the active region to provide an output for the VCSEL.

4. (New)The tunable VCSEL of claim 3 further comprising:
  - a bottom electrode mounted on top of the active region;
  - a top electrode mounted on the support; and
  - means for providing a voltage across the top and bottom electrode to modulate the output of the VCSEL.